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Owner-reported flea treatment measures and skin disease in cats

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Abstract

Objectives

The aim of this study was to obtain information regarding the use of flea treatments and owner-reported flea infestation and skin disease.

Methods

Owners of 1150 cats were recruited onto a long-term longitudinal study ('Bristol Cats' study) and asked to complete questionnaires at set time points. Questionnaires 1 and 5 were used and included data collection for kittens aged 2-4 months (T1) and at 2.5 years of age (T2). Owners were asked which brand of flea treatment, if any, was used at each time point. At T2 owners were asked if they had noted signs of skin disease or fleas on their cat within the previous 12 months and if they had sought veterinary attention for the skin disease or fleas. IBM SPSS version 23 (IBM Corporation, Armonk, NY, USA) was used for statistical analyses.

Results

Skin disease at T2 was reported by owners of 55/1150 (4.8%, 95% CI 3.7-6.2%) cats. Many owners who reported skin disease (25/55, 45.5%; 95% CI 32.3 – 58.7%) had not sought veterinary attention. There were 81/1150 (7.0%, 95% CI 5.56 – 8.52%) cats with reported head shaking and/or ear scratching within the past 12 months at T2. The majority of cats (204/286, 71.33%) received prescription flea treatments at both points. Use of non-prescription flea treatment at T2 was more likely to be associated with owner-reported skin disease/flea infestation compared to those who used prescription flea treatment ($P<0.001$). There was a significant association between the reported presence of fleas and reported presence of skin disease at T2 ($P=0.03$).

Conclusions and relevance

Despite the potential for reverse causality, the association between owner-reported skin disease and/or flea infestation in their cats and the use of non-prescription flea treatment was as expected. Use of flea

treatments and, in particular, the type of ectoparasite control used (prescription or non-prescription) should be carefully assessed when managing cats with skin disease.

Introduction

Hypersensitivity dermatological diseases in cats are usually triggered by environmental, food and / or flea allergens.¹ Various studies have explored the role of fleas in cats with dermatological disease in both first opinion and referral practice. In a study investigating the causes of pruritus in 502 cats, fleas were found to be the cause in 29% of cats.² Flea infestation has been reported as the second most common specific disorder recorded in cats attending primary-care veterinary practices in England, with 8.0% of cats affected in one study.³ A survey of flea infestation in dogs and cats in the UK during 2005 showed that the prevalence of flea infestation in cats was far higher at 21.1%.⁴ In the same study, almost half of the owners of dogs and cats were unaware of their pet's ectoparasite infestation. Another UK study reported that parasites and bacterial infections were the most common aetiological causes of cutaneous diseases diagnosed in a survey of dermatological conditions in first opinion small animal practices between 1998 and 2001.⁵

In recent years, new ectoparasite treatment products have become available for cats.⁶ Many cat owners will receive regular ectoparasite treatment for their cat(s) through their veterinary practice via health care plans or when they present their pet to a veterinary surgeon for annual vaccinations. Many non-prescription ectoparasite treatment products are also available in pet shops, human pharmacies, via the internet and supermarkets.

Previous studies investigating the prevalence of skin disease have been based on data collected from cats examined at veterinary practices.³ To the best of the authors' knowledge, there have not been any published surveys based on owner-reported use of ectoparasite treatment in cats and flea infestation or skin disease, in the UK. The aim of this study was to investigate owner-reported flea treatment measures (prescription versus non-prescription), flea infestation and skin disease in young cats whose owners were participating in a cohort study of UK pet cats (the 'Bristol Cats' Study).⁷

Materials and methods

Cat owners were recruited onto a long term longitudinal study ('Bristol Cats' Study) between 1 May 2010 and 31 December 2013. Data for this study were obtained from cat owners who had completed questionnaires 1 and 5 of the Bristol Cats Study; questionnaires 1 <https://smvsfa.onlinesurveys.ac.uk/bristol-cats-study-questionnaire-1-kitten-aged-8-16-wks-2> and 5 <https://smvsfa.onlinesurveys.ac.uk/bristol-cats-study-questionnaire-5-25-years-old-cats-2> were used for data analysis. Questionnaires 1 and 5 collected data from owners of cats aged 2 - 4 months (T1) and 2.5 years (T2) respectively. Owners were asked in Questionnaire 1 (T1) to indicate which brand of flea treatment they had used for their cat from a pre-prepared list of different prescription and non-prescription flea treatments (see Table 1). These included Advantage, Advocate, Bob Martin flea collar, Bob Martin flea spray, Bob Martin spot on, Frontline Combo, Frontline spot on, Program Plus, ProMeris, Stronghold, Supermarket own brand flea treatment, and 'don't know'. One 'other' option was available for owners to indicate the brand of flea treatment used if not included in the list provided. These brands were then categorised into prescription and non-prescription flea treatments. At T2 in questionnaire 5, owners were asked which brand of flea treatment had been used within the last 12 months. In this questionnaire owners were also asked if their cat had had fleas or if they had had signs of skin disease within the last 12 months and, if so, if they felt these signs were *not* serious enough to seek veterinary attention. Missing data and owners that had reported using both prescription and non-prescription treatments at either time point were excluded from the data analysis.

Descriptive statistics, which included the proportion and 95% confidence intervals for the frequency of owner-reported skin disease, flea infestation and head shaking, were calculated for cats at T2. A chi-squared test was used to test for association between owner-reported flea infestation and owner-reported skin disease at T2. A further chi-squared test was performed to test for association between prescription / non-prescription flea treatment at T2 and skin disease / flea infestation at T2. To reduce the potential for reverse causality, arising from prescription flea treatments being obtained from veterinary surgeons for cats presented with flea infestation, cats whose owners reported having sought veterinary attention for fleas or skin disease during the previous 12 months were removed from the dataset.

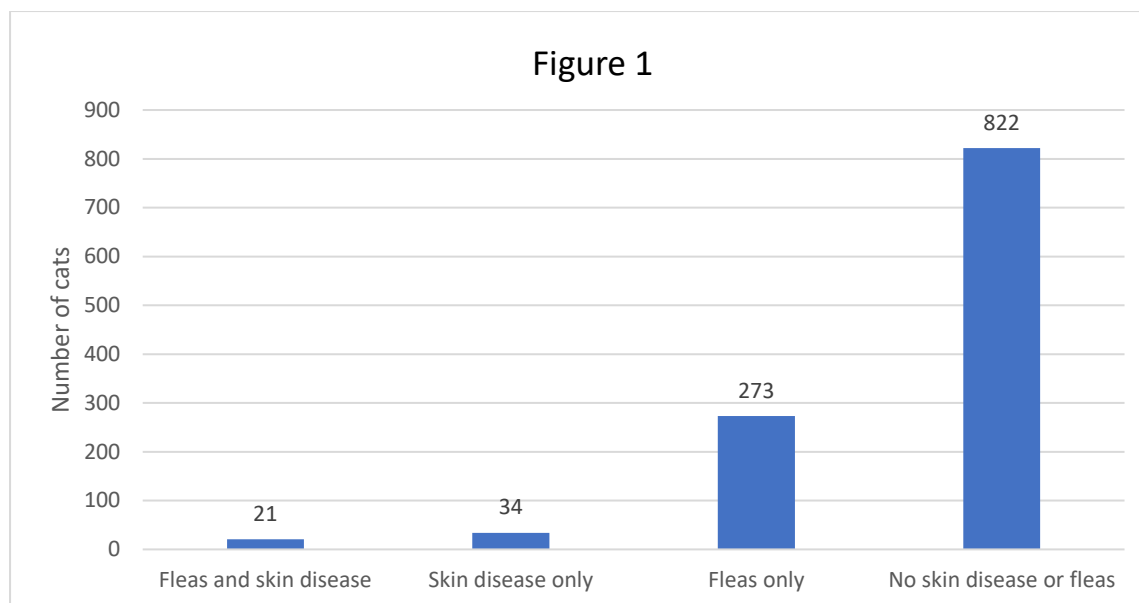
The Bristol Cats Study (BCS) has ethical approval from the University of Bristol (reference UIN/13/026). IBM SPSS version 23 (IBM Corporation, Armonk, NY, USA) was used for statistical analyses. Significance was set at $P < 0.05$.

Results

Data on 1150 cats were included in this study, representing 52% of cats from the BC cohort,⁷ of these 606 were male, 536 female and 8 had missing data for sex of cat. Most (1052, 91.5%) were reported to be domestic short hair or long hair cats, 86 (7.5%) were pedigree and a further 12 (1%) were reported to be of unknown breed.

Skin disease at T2 was reported by owners of 55/1150 (4.8%, 95% CI 3.7-6.2%) study cats. Many cats with owner-reported skin disease (25/55, 45.5% 95% CI 32.3 – 58.7%) were not presented to a veterinary surgeon by their owner for examination of the condition(s). Figure 1 shows the number of cats whose owners reported both fleas and skin disease (21 cats), only skin disease (34 cats) or fleas (273 cats) at T2; or no signs of skin disease or fleas (822 cats), within the past 12 months. There were 81/1150 (7.0%, 95% CI 5.56 – 8.52%) cats with reported head shaking and/or ear scratching within the past 12 months at T2. Of these, only eight of the cats (9.9%) had owners who sought veterinary attention for this issue.

Figure 1: The number of cats out of 1150 study cats within the Bristol Cats Study cohort whose owners reported signs of skin disease, fleas, or both, at T2 (at 2.5 years of age)



A total of 984 owners of the original 1150 study cats provided details about their flea treatment at both T1 and T2. Excluding owners who did not know the brand of flea treatment used at T1 and/or T2 and those reporting using both prescription and non-prescription products; the majority (204/286, 71.33%) used prescription flea treatments at T1 and at T2. The flea treatments that were listed by owners are shown in Table 1 along with the number of cats receiving each treatment.

Table 1: The number and percentage of cats in the Bristol Cats Study cohort whose owners reported using specific flea products.

Flea control product (active ingredient)	Which brands of dewormer and / flea treatment have you used for this kitten? Tick all that apply T1 (n)	During the last year, which brands of dewormer and/or flea treatment have you used for this cat Tick all that apply T2 (n)
Advantage (imidacloprid)	53	156
Advocate (imidacloprid, moxidectin)	188	410
Bob Martin flea collar (margosa)	7	12
Bob Martin flea spray (dimethicone)	5	10
Bob Martin spot on (fipronil)	17	63
Frontline combo (fipronil, (S)-methoprene)	85	112
Frontline spot on (fipronil)	136	249
Program Plus (lufenuron, milbemycin oxime)	3	17
ProMeris (metaflumizone) <i>No longer available</i>	1	4

Stronghold (selamectin)	86	127
Supermarket own brand flea treatment	2	8
Don't know	134	46
Other (please specify)	318 (may include wormers)	292 (may include wormers)

The reported presence of fleas at T2 was associated with an increased likelihood of reported skin disease at T2 ($P=0.03$). Forty-two cats that had been presented to a veterinary surgeon for skin disease ($n=23$) or flea treatment ($n=17$) or both ($n=2$) were removed from the dataset. A chi-squared test revealed that reported use of non-prescription flea treatment at T2 was significantly more likely to be associated with owner-reported skin disease / flea infestation at T2 compared to those who used prescription flea treatment ($P<0.001$).

Discussion

This study has shown that nearly 5% of cats drawn from the “Bristol Cats study” cohort were reported by their owners to have had dermatological disease in the 12-month period up to 2.5 years of age. A positive correlation between owner reported presence of fleas and the use of non-prescription flea treatment was seen. From the style of questionnaire it is difficult however to distinguish between cause and effect. It is generally assumed that non-prescription flea treatment is less likely to be as efficacious as prescription flea treatment in managing fleas; although a variety of factors can impact on the efficacy of treatments for flea control.⁸

Skin conditions, including ear disease, have long been recognised as a common reason for presentation of a cat to a veterinary surgeon;^{9,10} furthermore, it is assumed that ear disease is much more common in dogs than in cats.¹¹ Therefore, it was unexpected to see that owner reports of ear disease (head shaking and scratching) amounted to 7% of the selected cohort, and that most of these cats were not presented for veterinary attention. This finding needs to be corroborated and the reasons for why owners do not present such cats for veterinary intervention need to be assessed.

A key feature of the Bristol Cats Study is that most of the data are provided by cat owners, thereby providing an insight into cats that show signs of dermatological disease but are not necessarily presented to a veterinary surgeon. Owners within the study are hypothesised to be more motivated or

observant than the 'average' cat owner in the UK and it could be argued that owners in the cohort are more likely to visit a veterinary practice, but despite this a relatively low percentage of cats were presented for veterinary care when fleas or dermatological disease had been noted.

Cats were removed from analysis whose owners had taken them to a vet for fleas or skin disease within the previous twelve months. This does however limit the analysis to only including those cats whose flea burden or skin disease was mild enough not to warrant a trip to the vet. Some owners may have also consulted a member of staff at their veterinary practice or pet store for flea treatment advice, without having presented their cat for examination.

Although owners were asked if flea treatment had been used, the frequency of flea treatment application was not determined. In future, when assessing the efficacy of flea treatment measures, it would be critical to ask about the frequency of application and compliance with the instructions for use in the product data sheet.

The Bristol Cats Study has a good retention rate⁷ and it will be interesting to look at data collected from cats at older ages to see if there is a change in the prevalence of skin disease or in the use of flea treatments reported by the owners of these cats.

Conclusion

Given that skin disease is commonly seen in cats in first opinion practice, it was recorded that just under half (45.6%) of cats whose owners noticed skin disease, and the majority (90.1%) whose owners noticed head shaking or ear scratching did not take their cat to a veterinary surgeon. Within this cohort of cats, skin disease appeared to be associated with the presence of fleas. Skin disease and/or flea infestation in cats at age 2.5 years was more likely to be observed in cats receiving non-prescription flea treatment.

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